

WEST Search History

DATE: Friday, January 16, 2004

Hide?	Set Name	Query	Hit Count
		<i>DB=USPT; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L25	L24 and (\$4acrylic acid or maleic acid or fumaric acid or sulfonic acid or phosphoethyl\$4acryalate)	64
<input type="checkbox"/>	L24	L23 and (multivalent cation or Ca or magnesium or Mg or Zn or zinc or calcium)	74
<input type="checkbox"/>	L23	L22 and l14	104
<input type="checkbox"/>	L22	523/201,200,205;524/504,822,834.ccls.	2758
<input type="checkbox"/>	L21	L20 and (multivalent cation or Ca or magnesium or Mg or Zn or zinc or calcium)	3
<input type="checkbox"/>	L20	L18 and (seed or multistage or multi stage)	4
<input type="checkbox"/>	L19	L18 and seed or multistage or multi stage	34220
<input type="checkbox"/>	L18	(5149745 or 3793402 or 3971835 or 5534594 or 5599854 or 5998538 or 4325856 or 4654397 or 4814373).pn.	9
		<i>DB=USPT,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L17	L15 and (multivalent cation or Ca or magnesium or Mg or Zn or zinc or calcium)	18
<input type="checkbox"/>	L16	L15 with (multivalent cation or Ca or magnesium or Mg or Zn or zinc or calcium)	2
<input type="checkbox"/>	L15	L14 with (\$4acrylic acid or maleic acid or fumaric acid or sulfonic acid or phosphoethyl\$4acryalate)	45
<input type="checkbox"/>	L14	L13 or l6	1345
<input type="checkbox"/>	L13	(multi stage or multistage)emulsion polymerization	170
<input type="checkbox"/>	L12	L11 and (multivalent cation or Ca or magnesium or Zn or zinc or calcium)	26
<input type="checkbox"/>	L11	l5 with (\$4acrylic or maleic or fumaric or sulfonic or phosphoethyl\$4acryalet)	60
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L10	l6 with (multivalent cation or Ca or magnesium or Zn or zinc or calcium)	9
<input type="checkbox"/>	L9	L6 and (multivalent cation or Ca or magnesium or Zn or zinc or calcium)	781
<input type="checkbox"/>	L8	L6 with (multivalent cation or Ca or Mg or Zn)	11
<input type="checkbox"/>	L7	L6 and (multivalent cation or Ca or Mg or Zn)	519
<input type="checkbox"/>	L6	seed adj3 polymerization	1443
<input type="checkbox"/>	L5	seed polymerization	927
<input type="checkbox"/>	L4	see polymerization	34
		<i>DB=USPT; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L3	L1 and (Ca or Zn or Mg)	0

<input type="checkbox"/>	L2	L1 and multivalent cation	0
<input type="checkbox"/>	L1	(6403703 or 6488983 or 6605318).pn.	3

END OF SEARCH HISTORY

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May 29, 2001

TITLE: Method of production of particulate polymers

The invention provides a process for the preparation of a particulate polymer having a mode particle size of at least 200 .mu.m, the improvement comprising the use of substantially monodisperse polymeric particles as polymerization seeds in a suspension polymerization preparation of said particulate polymer.

Viewed from one aspect the invention thus provides the use of substantially monodisperse polymeric particles as polymerization seeds in a suspension polymerization preparation of a particulate polymer having a mode particle size of at least 200 .mu.m, preferably at least 300 .mu.m.

Viewed from a further aspect the invention also provides a process for the preparation of polymer particles by seeded suspension polymerization, characterised in that as seeds are used polymer particles having a CV of less than 12% and a mode particle size of between 60 and 1000 .mu.m (preferably between 100 and 800 .mu.m and more preferably 300 to 700 .mu.m) and in that polymerization is so effected that the ratio of the mode particle size of the seeds to that of the suspension polymerization product is in the range 1:1.4 to 1:3, preferably 1:1.58 to 1:2.72, more preferably 1:1.81 to 1:2.47.

The processes of the invention are especially suitable for the production of EPS beads, but the processes may be used for the preparation of any particulate polymer producible by suspension polymerization, in particular styrenic homo- and copolymers and vinyl homo- and copolymers. Examples of appropriate monomers include vinyl aliphatic monomers such as esters of acrylic and methacrylic acids, acrylonitrile, and vinyl aromatic monomers such as styrene and substituted styrenes.

The initial monodisperse particles may be transformed into larger substantially monodisperse polymer seeds by a suspension polymerization process substantially as described in U.S. Pat. No. 5,147,937 (Frazza), with the number and duration of the individual polymerization stages being selected to yield a final substantially monodisperse seed product of the desired mode particle size. In general the desired mode particle size for the final seed product will conform to a size from which the final suspension polymerization product may be produced with the desired median particle size in one, or less preferably more than one, polymerization stages in a single reactor. Thus final seed mode sizes may typically be within $\pm 10\%$ of 170 μm , 340 μm , 600 μm and 925 μm for the manufacture of final product beads of mode sizes 400, 600, 1000 and 1300 μm , i.e. suitable for use as different grades of EPS beads for example.

Other comonomers which may be used include ethylenically unsaturated monomers for

example acrylic acids and esters (such as acrylic acid, methyl acrylate, ethyl acrylate, butylacrylate, methacrylic acid, methyl methacrylate and ethyl methylmethacrylate), maleic acid and esters thereof (e.g. dimethyl maleate, diethyl maleate and dibutyl maleate), fumaric acids and esters thereof (e.g. dimethyl fumarate and diethyl fumarate), vinyl monomers, and acrylonitrile.

Detailed Description Text (29):

As with conventional suspension polymerizations, it is also preferred to include one or more stabilizers in the reaction medium. It is particularly preferred to include a suspension stabilizer in the aqueous seed suspension and an emulsion stabilizer in the aqueous monomer emulsion which is added thereto. Examples of suitable stabilizers include ionic, ethoxylated ionic, non-ionic and polymeric amphiphilic molecules and inorganic particles, e.g. water-soluble high molecular weight materials, celluloses (including cellulose ethers for example hydroxyalkyl methylcelluloses such as hydroxypropylmethyl celluloses, available for example as Methocel K-100), polyols, polyvinylalcohols, polyalkylene oxides and inorganic materials such as calcium phosphate and magnesium pyrophosphate.

Detailed Description Text (88):

A styrene emulsion was prepared from 185 g water, 1.3 g Igepal CO990, 70 mg Irganox 1330, 0.3 g of dibenzoylperoxide and 92 g styrene, emulsified for 2 minutes in an Ultra Turrax mixer. The emulsion was added to the reactor over 4 hours 40 minutes at 0.5 mL/min (1 hour), 0.7 mL/min (1 hour), 1.0 mL/min (1 hour) and 1.5 mL/min (100 minutes). Polymerization of the mixture was then allowed to continue for two hours. The product was recovered and analyzed.

Current US Cross Reference Classification (3):
523/205

Foreign Reference Country Code (1):
CA

Foreign Reference Group (1):
1 093 747 19810100 CA

CLAIMS:

1. In a process for the preparation of a particulate polymer having a mode particle size of at least 200 .mu.m, the improvement comprising the use of substantially monodisperse polymeric particles as polymerization seeds in a suspension polymerization preparation of said particulate polymer.

25. A process for the preparation of polymer particles by seeded suspension polymerization, characterised in that as seeds are used polymer particles having a CV of less than 12% and a mode particle size of between 60 and 1000 .mu.m and in that polymerization is so effected that the ratio of the mode particle size of the seeds to that of the suspension polymerization product is in the range 1:1.4 to 1:3.